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(54) Title: PROCESS FOR THE PREPARATION OF MARZIPAN-LIKE PRODUCTS FROM FRUITS AND VEGETABLES

(57) Abstract

Process for the preparation of novel, marzipan-like products from fruits or vegetables containing at least 70 mass % of dry substance. According to the invention the starting material is pulpified, to the mass obtained 0 to 25% by mass of a concentrated lactalbumen preparation and 0.4 to 20% by mass of a wettable, gel-forming stabilizing composition are added, provided that the total amount of the two additives is at leàst 1.0% by mass related to the mass of the starting material, the additives are homogenized with the pulpified mass at a pH of 3 to 4.5, while, if desired, further additives are added, and the product is shaped and if desired, coated by techniques conventionally used in the sweets industry.

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# PROCESS FOR THE PREPARATION OF MARZIPAN-LIKE PRODUCTS FROM FRUITS AND VEGETABLES

The invention relates to a process for the preparation of novel, marzipan-like products from fruits and vegetables. The novel products improve the assortment of confectioneries.

Marzipan is one of the most popular products of sweets industry and is conventionally prepared by homogenizing almond or kernel of nut admixed with sugar in roll throats getting ever tighter, optionally softening the mixture obtained by adding starch or invert sugar syrup and if desired, adding an emulsifying agent. In addition to its pleasant, characteristic flavour marzipan is valuable due to its soft consistency which makes possible an easy shaping. Therefore, in the confectionery industry desserts, figures, corpora and piece goods of varied shapes are produced from marzipan.

The marzipan-like consistency is in connection with the formation of a heterogenous disperse system containing a liquid and a solid phase. The liquid phase is a water/oil emulsion or fats, the solid phase consists of sugar crystals and the dry substance of oil seeds. Experience shows that the fats need of marzipan depends on the dispersity grade and accordingly, the specific surface

of the solid components, since the fats form a coating on the surface of solid particles and in this way bind them together. On the other hand, the particles are not rigidly bound by the intermediate fat layer, rather can be easily shifted, therefore, the whole material is elastic. In other words, the fats play essentially the role of a binding material among the grains. Their disadvantage is, however, their well known liability to growing rancid and the fats migration to the surface of the products during storage, which impairs the quality of the products.

Various efforts have been made to prepare a product with a satisfactory quality and consistency and to improve the economicity of the production by reducing the quantity of the oily seeds or fats employed or by replacing them with other materials.

Our intention was to prepare products with a character and consistency similar to those of marzipan from sweetened fruits and vegetables which have a soft character, are not sticky, are easy to shape, keep their shape and have a pleasant flavour. For sake of simplicity the products according to the invention will furtheron be referred to as having a "marzipan-like" character. Our target is to decrease the quantity of the fats or oily seeds in the product and hence to improve the storability ans simplify the manufacturing process.

The sweetened fruits and vegetables are known to have a 75 to 82 mass % of dry substance content and an elastic consistency which allows their manual shaping. Until now it has not seen possible to prepare well shapable and flavourable products with a soft consistency from such

row materials, since although the rolled or pressed fruits or vegetables loose their elastic character, they cannot be converted into marzipan-like product by the addition of starch, sugar or other additives conventionally used in the sweets industry.

We recognized that the required elastic, shape-keeping consistency which allows the preparation of marzipan-like products from fruits and vegetables can be achieved by admixing the starting material after pulpifying by cutting, with a well wettable, gel-forming stabilizing agent or a concentrated lactalbumen composition, preferably in an acidic medium, homogenizing the mixture and allowing it to stand before further manufacturing. The quantity of the materials to be added to the pulpified fruits or vegetables is regulated to give a soft but not gelatinous product, which keeps its shape.

According to the invention marzipan-like fruit and vegetable products are prepared from sweetened fruits and vegetables containing at least 70 mass % of dry substance by pulpifying the starting material by cutting, adding 0 to 25 mass % of a concentrated lactalbumen preparation and 0.5 to 20 mass % of a wettable gel-forming stabilizing agent related to the mass of the pulpified material, provided that the total amount of the two additives related to the mass of the starting material is at least 1.0 mass %, and the additives are added preferably under acidic conditions, in a pH-range of 3 to 4.5. The mass obtained is homogenized, if desired further additives used in the sweets industry are added, the mass is shaped and the shaped product is coated by dipping, smearing or

crumbing.

The starting material is reduced in size in a screw-press, cutter or egalizator. The concentrated lactalbumen preparation can for example be milk powder or youhourt powder. As a wettable gel-forming stabilizing agent carragene, ultraamylopectine, caseine, alginate, a soluble starch derivative or a composition containing such materials is employed. As a further additive for example dextrose, fruit aroma concentrate, pigments, etc. can be added to the mass during homogenization. The desired acidity is adjusted e.g. by citric acid, malic acid, tartaric acid or phosphoric acid.

If desired, the homogenized mass is allowed to stand, dried and optionally chilled. As a sweetened fruit for example égouttée, sugat /candiedfruit/ or a sweetened vegetable preparation, dried fruit or broaken fragments thereof can be used. The shaped product can be sprinkled with saccharose crystals, dextrose, oily seed grist, sugar or "nonpareil", crumbed, dipped into chocolate, candied, etc. These additional treatments do not influence the consistency of the product. If the consistency of the product had been adjusted properly by a proper selection of the quality and proportions of the additives, the product preserves its marzipan-like character and can be further manufactured easily. If desired, diabetic marzipan-like fruit and vegetable preparations can also be prepared by the process according to the invention, without the addition of fats.

The composition, appearance and shape of the homogenized mass prepared according to the invention can be varied within wide limits. It is possible to add

further additives, e.g. fruit pieces, vegetables, alcoholic fruits or vegetables, oil seeds, pigments, natural or synthetic aroma materials, etc. to the homogenized mass before shaping, which results in a wide variety of end products. The selection of various coating materials, materials for crumbing, e.g. sweet crumbs, sugar grits, coarsely ground seeds, etc. provides further possibilities for the final form of the products. In this manner for example the reduced copies of the original fruits, e.g. apple, pear, can be prepared, while the product preserves the characteristic taste of the natural fruits. For sprinkling or crumbing dried youhourt, fruit-youhourt or other powdered milk products can also be used.

We have found that the pulpified, sweetened fruits or vegetables and the gel-forming stabilizing agents and further additives interact during standing, especially in an acidic medium to afford a plastic, figurable product, which preserves its shape. Surprisingly, the consistency of the reversible gel is essentially the same as that of the heterogenous disperse body of marzipan. By the method provided in the present invention new, marzipan-like products can be prepared from sweetened fruits or vegetables, without the addition of fats or oily seeds. The mass pulpified by reducing in size is very suitable for egalization with the further additives and as a result, an entirely homogenous mass can be obtained. It is advisable to allow the pulpified mass to rest for a short time before shaping, or optionally employing an intermediary chilling to ensure that a gel consistency is formed.

After the selection of the fruits or vegetables to be manufactured preferably a test pulpification is performed. The pH of the pulpified mass is adjusted to below 6, preferably between 3 and 4.5, essentially depending on the materials to be manufactured and the shape-keeping capability of the shaped samples. An optimum flavour was obtained between pH 3 and 4.5. The suitable consistency makes shaping and the further manufacture of the shaped product possible.

The main advantage of the process according to the invention is that from fruits and vegetables having a high nutritive value marzipan-like, new sweets can be prepared in a well storable form. By employing various further additives the flavour, colour, shape and appearance of the products obtained can be varied within wide limits.

The invention will now be further illustrated by the following Examples, which are for illustration, but not limitation of our invention.

Example 1

200 g. of sweetened apples are pulpified by passing through a screw-press. The sweetened apples are prepared by boiling 500 g. of raw, pre-treated apples, in a solution containing 380 g. of sugar, 120 g. of water, 7.5 g. of citric acid and 1 g. of potassium sorbate for 6 minutes. After boiling the fruits are lifted, the syrup is strained off and the heat-treated apples are dried. To the pulpified mass 1.2 g. of citric acid and 2 g. of sodium amalginate homogenized with 10 g. of saccharose are added. After homogenization the mass is filled into suitable moulds and chilled in a chilling tunnel. The pieces taken

out of the moulds are dipped into chocolate in a conventional manner.

Example 2

250 g. of sweetened vegetable marrow are pulpified in a cutter. To the mass obtained 3 mg. of green food-pigment, 0.6 g. of citric acid and 1 g. of carragene are added. The mixture is then homogenized with 50 g. of dextrose and is rolled out to a 1.5 cm. thick plate. From the product leaf-shape pieces are cut, which are then polished in a polishing machine.

Example 3

300 g. of a sweetened fruit mixture are pulpified. The sweetened fruit, which may contain plum, apple and pear is prepared by keeping 1-2 cm thick fruit pieces in a syrup containing more than 68 % of sugar at the boiling temperature, for 15 minutes. The ratio of the starting fruit mixture to the sugar syrup is adjusted to 1:3. The fruits are lifted and the syrup is strained off. In the syrup 1.5 % by weight of citric acid are dissolved while hot, and the product is allowed to stand in the sugar syrup, cooled down for 8 hours. The product is dried at about 50 °C to a water content of 25 %. To the pulpified mass 2 g. of citric acid, 0.2 g. of phosphoric acid, 0.3 g. of orange aroma and 10 g. of a fruit aspic stabilizator composition are added. After homogenization the mass is filled into a plastic hose and the hose is sealed after each 70-100 g.

Example 4

250 g. of tomato sweetened as described in Example 3

are pulpified in a mixer having a turmix construction. To the pulpified mass 1.1 g. of citric acid, 10 g. of a stabilizing composition and 60 g. of dextrose are added. The stabilizing composition contains 25 parts by mass of caseine and sodium citrate, 12 parts by mass of sodium amalginate and a small amount of sodium bicarbonate related to 60 parts by mass of sugar. After careful homogenization small rods are rolled on a suitable machine, which are then cut to 20 mm. pieces, dipped into chocolate and their top is decorated by "nonpareil".

Example 5

To 310 g. of apple égouttée 32 g. of thin milk powder, 0.66 g. of citric acid and a stabilizator compositin containing 15 g. of soluble starch are added, under pulpification. To the pulpified mass 150 g. of dextrose are added and 2 cm. thick plates are prepared. Various shapes are cut off the plate, which are then dipped into fondant and decorated with chocolate.

Example 6

200 g. of apples sweetened as described in Example 1 are pulpified with 2.5 g. of citric acid, 10 g. of a lactalbumen preparation, 2 g. of a stabilizator composition and 1 g. of apple distillate. After pulpification rods are prepared from the mass which are allowed to dry. The 6 cm. rods are dipped into chocolate.

Example 7

450 g. of plum sweetened as described in Example 3 are homogenized with 20 g. of a lactalbumen concentrate, a

stabilizator composition containing 25 g. of a soluble starch derivative and 3 g. of citric acid, in a cutter. The mass is cooled, allowed to stand and is extruded. The product is crumbed in youhourt powder or dextrose.

Claims:

1. Process for the preparation of marzipan-like products from fruits and vegetables containing at least 70 mass % of dry substance, which comprises pulpifying the starting material by reducing in size, adding to the mass obtained 0 to 25 % by mass of a concentrated lactalbumen preparation and 0.4 to 20 % by mass of a wettable, gel-forming stabilizing composition, provided that the total amount of the two additives is at least 1.0 % by mass related to the mass of the starting material, homogenizing the additives with the pulpified mass at a pH of 3 to 4.5, while, if desired, adding further additives conventionally used in the sweets industry, shaping the plastic, shape-keeping mass obtained, and if desired, coating the product by dipping, smearing or crumbing.

2. A process as claimed in claim 1, which comprises reducing the starting material in size in a screw press, cutter or egalizator.

3. A process as claimed in claim 1 or 2, which comprises using as a concentrated lactalbumen preparation skimmed milk powder or youhourt powder.

4. A process as claimed in any one of claims 1 to 3 which comprises using a wettable stabilizing agent carragene, ultraamylopectine, caseine, alginate, a soluble starch derivative or a composition containing two or more of such materials.

5. A process as claimed in any one of claims 1 to 4, which comprises adding as a further additive saccharose, invert sugar, dextrose or a fruit aroma concentrate to the mass.

6. A process as claimed in any one of claims 1 to 5, which comprises adding citric acid, fumaric acid, tartaric acid or phosphoric acid to the mass.

7. A process as claimed in any one of claims 1 to 6, which comprises using as a starting material égoutté or candied fruit or a sweetened vegetable preparation, dried fruit or broaken fragments thereof.

8. A process as claimed in any one of claims 1 to 7, which comprises sprinkling or crumbing the shaped product with saccharose crystals, dextrose, an oily seed grist, sugar or chocolate grits.

9. A process as claimed in claim 1 or 8, which comprises dipping the shaped product into fondant or chocolate, candying or polishing same.

# INTERNATIONAL SEARCH REPORT

International Application No PCT/HU83/00016

## I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) [3]

According to International Patent Classification (IPC) or to both National Classification and IPC [3]

A23G 3/00

## II. FIELDS SEARCHED

Minimum Documentation Searched [4]

| Classification System | Classification Symbols |
|---|---|
| IPC[3] | A23G 3/00 |

Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched [5]

## III. DOCUMENTS CONSIDERED TO BE RELEVANT [14]

| Category * | Citation of Document, [16] with indication, where appropriate, of the relevant passages [17] | Relevant to Claim No. [18] |
|---|---|---|
| Y | SU, A, 74327 (P.I.Rurua) 28 February 1949 (28.02.49) | 1,5 |
| Y | US, A, 3554766 (Phillip Morris Incorporated) 12 January 1971 (12.01,71) | 1,5,6,7 |
| A | SU, A, 511929 (E.V.Shpakova et al), 30 April 1976 (30.04.76) | 8 |

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## IV. CERTIFICATION

| Date of the Actual Completion of the International Search [2] | Date of Mailing of this International Search Report [2] |
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| 29 June 1983 (29.06.83) | 27 July 1983 (27.07.83) |
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